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‘Risk and value in labour and capital markets: The UK corporate economy, 1980-2005’

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RISK AND VALUE IN LABOUR AND CAPITAL MARKETS: THE UK CORPORATE ECONOMY, 1980-2005

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ABSTRACT

The paper sets out a theoretical model linking stock market financial risk to labour market conditions, including labour intensity and the risk arising from the specification of labour contracts. A value added analysis is conducted combining national and firm level accounts data to examine the relationship between the share of value and the share of risk, contrasting manufacturing and service industries. In conjunction with a firm level analysis, empirical support for the model is established showing rational trade-offs between the risk and value appropriations of investors and employees and a less rational accumulation of structured debt finance as the UK economy has shifted from manufacturing to services in the last 30 years. The shift to services, flexibility and deregulation has tended to promote labour intensity, inflexibility of cost structures, and, as a consequence greater financial risk.

Keywords: Operating, financial, leverage, risk, labour, flexible

INTRODUCTION

Two important trends have characterised the micro economic structures of many developed economies since the early 1980s. The first is the development of financialization[1] and the associated doctrine of shareholder value maximization. The second is flexibility, characterised for example by the emergence of the flexible firm (Atkinson & Meager, 1986) as an alternative to mass production (Piore & Sable, 1984), flexible labour markets and associated employment practices. Flexibility in this sense is regarded as a feature of a larger transition from regulated labour market policies, favouring planning and stable employment, towards a neo-liberal approach favouring laisser-faire (Hutton, 1995). These trends have been developed in parallel, and some association has been suggested in general terms, for example the pressures of globalization that create a discourse of risk and uncertainty as a means of imposing work discipline (Amoore, 2004). The relationship between the rise of shareholder value ideology and corporate restructuring has also been widely discussed (Jensen, 1993, 2002; Williams, 2000; Froud et al., 2000; Lazonick & O'Sullivan, 2000; Toms & Wright, 2002, 2005).

However, there have been few direct examinations of the theoretical and empirical relationship between flexibility and financial risk. Specifically, little is known about the relationship between the flexibility of the firm's cost structure, including its wage costs and the corresponding degree of stock market risk. If flexibility is understood broadly as 'the possibility firms have of adapting their productive apparatus, in particular employment levels, to variations without delay (Boltanski and Chiapello, 2007, p.194), there are two possible empirical stories likely to contribute interesting evidence to the wider debates referred to above. On the one hand, the presence of certain costs, such as knowledge-based labour, research or capital intensive activities, and scale based production, which have been linked to competitive advantage (Grant, 1996; Lazonick, 1991) may also lead to the creation of fixed cost structures that promote shareholder risk. Conversely, if Beck (2000) is correct, and the growth of temporary and fixed term contracts has shifted risk from the employing organization to the individual, then the presence of flexibility might be expected to

attenuate stock market risk. In this second case, flexible firms and flexible labour markets are imposed for their impact on underlying cost behaviour, manifesting themselves as an attack on 'fixed cost shelters' that have hitherto protected layers of managerial hierarchy (Armstrong, 2002). Accordingly, meeting investor demand for higher returns entails not only resource reallocation but also risk redistribution (Jacoby, 2005, p. 77). In other words, it might therefore be supposed that a significant expected outcome of globalization and financialization should be not just increased shareholder returns but also the reduction of shareholder risk through flexibilization.

Of course, the degree of flexibilization is an empirical question, not least because like wage reductions, risk increases are naturally resisted by employees. There is only a certain degree to which risk can be imposed through regulation, not least because the shift to a service based knowledge economy implies increased monitoring problems for boards and investors vis-à-vis the labour process since the application of knowledge is less tangible and in some cases output is less directly quantifiable.

The purpose of this paper is to present a theoretical model using the concept of risk to link labour markets, firms and capital markets. That framework is then used to develop empirical propositions to analyse empirically the relationship between rigidity/flexibility in firms' cost structure and corresponding levels of stock market risk in the UK. Empirical proxies are estimated using firm-level accounting and stock price data. It compares the relationship in two periods: the mid 1980s and the mid 2000s and also examines differences by economic sub-sector.

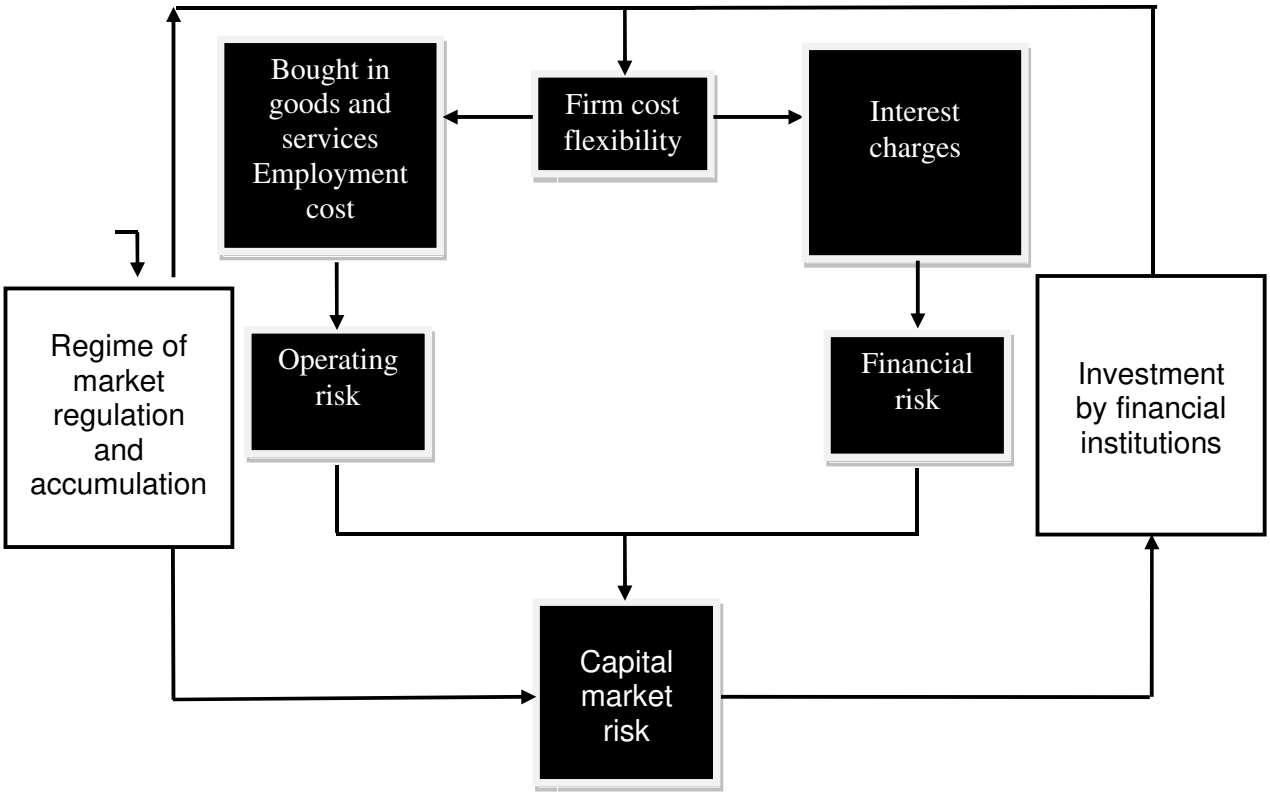
FIRMS, MARKETS AND RISK: AN INTEGRATED THEORY

The current paper is by no means the first to propose the simultaneous analysis of capital and labour market relationships. Froud et al (1997, p. 348) provide a consciously minimalist and convenient account of the relationship between firms and the workforce as mediated inter-alia by cash hungry capital markets. To develop the conceptualisation of the mediation process for current purposes, it should be recalled that insofar as capital markets demand cash, they take the form of dividend

payments and capital gains form another component of the total return. Implied risk, in terms of the contingent nature of capital gains and threats to stability and growth of dividend income streams are sources of risk to capital market investors which rationally they will seek to minimise. If, as is the case in relatively saturated product markets, demand is subject to downside risk, the logical response from the firms' perspective in the Froud et al model is to impose flexibility on the workforce and associated employment costs, which has the effect of stabilising the rate of profit regardless of variations in demand.

However, unlike previous models, this paper finesses the integration of capital and labour market dynamics using the concept of risk. Figure 1 illustrates the proposed relationships. Like Froud et al's model, it is consciously minimalist, and excludes, only for the purpose of developing analytical power, the complex interactions arising from regimes of accumulation and regulation. Instead, these are shown as a moderating influence of exogenous origin.

Figure 1: Firms, Markets and Risk



Regimes of accumulation vary through time, for example, Fordism, post-Fordism and neo-Fordism and are the subject of wider historical processes. For the specific purposes of the model, the regime of regulation and accumulation is characterised by continua: regulation versus deregulation, nationalization versus privatization, concentration versus decentralisation of capital, financialization versus socialization, globalization versus separate development and so on. In the UK case, as elsewhere, a useful contrast can be made between the regime of regulation and accumulation that prevailed until the early 1980s and the regime of subsequent decades. In figure 1, the regime of accumulation and regulation operates in two directions. First, through the labour market and labour process, it impacts on the structure of firms and through their relative bargaining power in supplier and labour markets impacts in particular upon their cost structure. Levels of employee insurance and protection for example influence the nature of the contract of employment, which together with the nature of the labour process, in terms of the tangibility of inputs and outputs, influence the extent to which remuneration can be linked to productivity. Second, the regime of accumulation and regulation impacts on capital market structure and regulation, for example rules about corporate governance, ownership structure, and forms of debt and equity finance. Mapping these two approaches, it can be seen that the model is intended to complement and build upon the regulationist approach rather than contradict it.

A concept of central importance to the operation of figure 1 is firm cost flexibility. Again, this can be considered in terms of a continuum between flexibility and inflexibility. If firm A has completely variable cost (i.e. total flexibility), and sales (S) minus total cost (TC) is 100 – 80, the rate of profit is profit (P) divided by (S) = 20%. A fall in demand for the firm's products of 10%, also results in a fall in cost of 10%, so that S – TC = 90 – 72 = 18 and the rate of profit is 18/90 = 20%. Under this assumption, the rate of profit remains constant regardless of the level of output. In contrast, if firm B has a similar starting point but all its costs are fixed, the rate of profit falls: 90 – 80 = 10, 10/90 = 11%. In the case of firm A, risk arising from variation in demand is distributed capital market investors 0%, firm stakeholders 100%. In the case of firm B, it is vice versa. The

model applies this concept to three specific groups of stakeholders, with equity investors treated as a residual group. First, suppliers who provide bought in goods and services and who might benefit or not in these terms from the degree of contract flexibility. The second group are employees, who may benefit or not from the relative flexibility of the negotiated labour contract. Thirdly, debt holders, through the provision of loan finance, can impose some degree of cost inflexibility on the firm. Structured loan finance in particular imposes fixed costs on firms which has the same effect of allocating risk between lenders and residual shareholders. These relationships were first explained by Modigliani and Miller (1958), and require no modification for the purposes of figure 1. Other forms of credit, such as overdrafts, may impose costs more likely to vary with the activity of the firm and might therefore be viewed as more risky from the point of view of the lender.

Risk arising from the contractual status of the first two groups comprises operating risk from the point of view of all stakeholders including residual equity shareholders. Operating risk manifests itself in particular in the form of variability of residual income streams. The third group, debt finance, leads specifically to financial risk. As with operating risk, the fixed element of associated interest costs can impact on the variability of residual income streams. The difference, however, is that to some degree, depending on the regime of accumulation and regulation, debt-holders can impose legally enforceable rights of asset realization above those of other stakeholders in the event of default. In other words, financial risk also comprises a bankruptcy risk element.

In combination, financial risk and operating risk impact on the level of stock market risk. An established financial model, the Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965) is a suitable vehicle for conceptualising such risk, since its purpose is to price risk according to the co-variance of the returns of an individual stock with the returns for a whole market index. In efficient markets, stock prices only reflect fundamental values (Summers, 1986) which correspond to the underlying cash flows of each traded firm, so the stock market covariance measure should reflect the degree of correspondence of an individual firm's cost flexibility to the market average. A firm with more than average fixed cost, for example, will have above average variability in profit and,

therefore, it should be expected, such variation in profit should lead the firm's stock price to demonstrate greater variability compared to the average as it progresses through the economic cycle.

It is the variability of the firm's stock return vis-à vis the general level of market return variability that determines the price of risky equity capital and hence reinvestment of profit in the corporate economy. Figure 1 links the price of risk to the underlying profit variability of the firm, which can be applied to CAPM based firm level investment decision making by estimating the beta of the project asset (Brearley, et al, 2006, pp.225-6). Normally the link to financial market price behaviour is considered sufficient as a determinant of the cost of risky equity capital for the firm as a whole (Buckley, et al., pp.225-229).[2] Shareholder value maximisation is an exact corollary of such calculations where CAPM co-ordinates determine the economic profit of the firm and its capitalization into goodwill or market value added. In the shareholder value model, in particular variants that consider the Stern Stewart trade-marked *Economic Value Added*, it is the return over and above a risk adjusted hurdle rate that is said to deliver surplus (Copeland, et al., 1994; Bromwich & Walker, 1998; Froud et al., 2000, p.779). Accordingly, shareholder risk reduction is a key driver of shareholder value, particularly if as Froud et al (2000, p.785) suggest, the realised rate of return is structurally constrained by the necessary costs of committed activities. However, risk reduction for shareholders equals concomitant risk increases for the employees of flexible firms and suppliers of labour markets. Accordingly, and represented in the final link in the model, the process of reinvestment in the economy through financial markets is moderated by the regime of accumulation and regulation and in turn results in a revised resource endowment and cost structure for the firm.

In summary, figure 1 presents a series of linkages between markets and stakeholder groups whose pay-offs are in part governed by the social division of risk, which is significantly moderated by the regime of accumulation and regulation. The model accommodates Aglietta & Breton's (2001) specificity and homogenisation dichotomy in that banks operate in the sphere of specific risk

and, through focussed lending, mitigate the hazard problems of capital arising from the generation of asymmetric information within the firm. Financial market participants on the other hand mitigate such problems through portfolio diversification and therefore only deal with the pricing consequences of the systematic, or homogenised, proportion of risk. The homogenisation aspect of the dichotomy is modified however, because the portion of risk, that is the risk premium, homogenised in financial market models, is systematically rooted in underlying relations in the firm and associated cash flows rather than merely changes in share prices. Further, systematic risk in financial markets can be linked to systematic variations in payment structures arising from the labour process.

Before developing empirical tests of the proposed relationships, it is useful to document the trends likely to impact on the nature and direction of hypotheses. The next section examines these with respect to the financialization of contractual relationships and the rise of differing measures of flexibility in the corporate economy.

FINANCIALIZATION AND FLEXIBILITY: EMPIRICAL TRENDS

Since the early 1980s, the regime of accumulation and regulation has been modified by several important, and related, tendencies. The first is the perceived value of flexibility in production in smaller firms (Sabel & Zeitlin, 1997) and the model of flexible specialisation in all firms including larger ones (Zeitlin, 2000) which has received considerable attention in recent literature. Since the 1960s, a pronounced shift towards services in terms of value added relative to manufacturing has been documented across a number of advanced economies including the UK (Froud et al., 1997).[3] High value added is particularly pronounced in financial services, but much less so in retail community and personal services (p.358). A distinction is made between neo-Fordism, which implies flexible labour markets and post-Fordism which implies flexible firms with high wage and high value activities (Leborgne & Lipietz, 1992). Considering the relationship between the firm and capital markets, the distinction is an important one, since neo-Fordist flexibility implies reduced

operating risk in favour of capital and at the expense of labour. Post-Fordism, on the other hand, implies fixed labour cost and high operating risk, favouring labour at the expense of capital. Which of the two is the dominant tendency is an important empirical question.

Employment flexibility has become a major management mantra and manifests itself frequently in the form of contract flexibility, with, from the employing organization's perspective, the benefit of rapid adjustability of the workforce size as demand for the firm's products or services shifts (Guest, 2004, p.1). Such 'low road' flexibility refers to a movement towards increasing cost-cutting, casualization and work intensification within labour markets (Michie & Sheehan, 2003; Bone, 2006). In the UK, 'low road' flexibility would appear to have increased dramatically in the 1980s and early 1990s (Hutton, 1997). According to the Department of Trade and Industry (DTI 2002; Tremlett & Collins, 1999) after being stable for a number for years up to 1991, at about 5% of the labour force, the temporary workforce grew to about 7.8% in 1997. Between 1984 and 1996, the numbers of temporary workers in the UK increased by 31 per cent (Legge, 1998). Boyer and Drache (1996, p. 17) represent services as offering low-skill, low-pay jobs contributing to the rise of the 'working poor'.

Alternatively, 'high road' flexibility is presented as empowering workers who gain new skills and greater autonomy, for example through multi-skilling (Michie & Sheehan, 2003). As Hirst and Zeitlin (2001, p.506) suggest, empowerment of employees in the work place has eroded class consciousness. Handy (1995) commends 'portfolio people' whose working lives are mobile and portable, rather than fixed and attached to a corporation. Although not asserted by the gurus too often, a corollary of effective knowledge workers is their control over the labour process. In this view, it is the knowledge endowed worker who asserts their power over the knowledge-hungry organization (Knell, 2000). High and low road elements would appear to be contained in Atkinson and Meager's (1986) model of the flexible firm, which comprises both a stable core workforce and a periphery of workers on a variety of less secure, shorter term or ad hoc contractual arrangements. The contingent workforce might include both low paid unskilled and expensive highly experienced

workers (Casey, et al., 1997).[4] There are associated and conflicting trends between white collar deskilling and blue collar upskilling with European evidence suggesting the latter is dominant (Jonsson, 1998). Meanwhile, the shift from manufacturing to services is likely to increase aggregate labour intensity (the proportion of total cost accounted for by labour), relative to capital.

Financial liberalization, meanwhile has strengthened the importance of connections between finance and the rest of the economy (Aglietta & Breton 2001, p. 434), making the analysis of the risk-based relationships suggested in figure 1 all the more important. Shareholder value analysis has been ideologically significant in this respect, although it offers nothing new in the analytical sense (Aglietta, 2000, p. 148). According to this view, financial leverage is used aggressively to satisfy capital market demands for growth in equity returns (Aglietta, 2000, p. 151). Associated financial strategies include management buy outs (MBOs), leveraged buy outs (LBOs) and share buy backs which have increased significantly in Britain since 1980 (Toms and Wright 2002). These increase equity returns but also increase stock market risk, which might be a particular problem when combined with increased operating risk arising from the changes in industry structure and employment relationships discussed above.

Flexibility in the firm's production capacity, including labour cost, increases its debt capacity, since ability to adjust to market conditions reduces default risk (Mackay, 2003). Huffman (1983) assumes the commitment to fixed capacity investment depends on the ex ante debt level. Therefore, the capacity decision attenuates the increase in equity risk caused by an increase in business risk but that attenuating ability decreases as either revenue declines or the level of outstanding debt increases. In view of the theoretical uncertainty in these relationships, some empirical testing is justified.

Several studies have examined the impact of the operating leverage ratio, which proxies for flexibility in the firm's operating cost structure, on stock market risk, usually in conjunction with the financial leverage ratio (Gahlon & Gentry, 1982; Mandelker & Rhee, 1984; Huffman, 1989; Li & Henderson, 1991; Lord, 1996). These studies have confirmed the importance of operating

leverage relative to financial leverage. These empirical results provide a useful platform for further research that relates these measures to long run changes in employment conditions.

Reflecting collectively on the tendencies discussed above, it is not clear that the supposed advantages in terms of risk avoidance will be unequivocally passed from shareholders to employees, and indeed that there may be a redistribution of risk between employee groups according to economic sector and status. Some empirical evidence on these relationships is useful, and in particular to see which sectors experience greater flexibility in aggregate cost flexibility. Company accounts have generally been neglected as a resource in the debates about the distribution and redistribution of value added between sectors and between stakeholder groups (Froud et al., 1997, pp. 345-6). In the analysis that follows, extensive use is made of firm-level data as a complement to analysis of national income data, in order to provide answers to the empirical issues raised in this section and as a test of the earlier theoretical model.

AN EMPIRICAL ANALYSIS

The empirical approach comprises three complementary analytical approaches. These are first a descriptive analysis of national statistics using Office of National Statistics (ONS) *Blue Book* and Organisation for Economic Co-operation and Development (OECD) data. Second, a descriptive analysis of two samples of firm level data drawn from the first half of the 1980s and the first half of the 2000s respectively, and aggregated for some purposes into a pooled sample. Third, inferential statistical analysis was conducted on the firm level sample. The purpose of the empirical analysis is to investigate the consequences of the shift to services in terms of the risk and reward mix for the workforce and any obverse shifts in this mix from the point of view of shareholders.

Table one shows stylised value added tables contrasting services and manufacturing in the two sub-periods. It is not possible to construct these tables from a single source, but by combining data from the OECD statistical survey of the UK, the ONS *Blue Book*[5] and averages from the sub-samples of firm level data, trading accounts by major sector can be constructed in this form. Such a

presentation is particularly useful as it enables real terms growth to be analysed into the components of employment costs and profits, as in conventional value added analysis, but also allows identification of changes in the composition of bought in goods and services. The calculations are conducted from the bottom up using firm-level data and industry indices. Value added is computed gross to include taxation, so that the ratio of net division between wages and profits can be computed and analysed. To complement the point to point comparisons in table 1, time series analyses of value added were also conducted.

Table 1: Value added comparisons, service and manufacturing sectors, 1984 and 2005.

	Year		Change
	1984	**2005**	**%**
Panel a) Services			
Sales	100.00	198.00	98.00
Bought in materials and services	76.27	122.98	61.24
Value added (VA)	23.73	75.02	216.13
VA split:			
Labour	15.90	50.49	217.55
Profit	7.83	24.53	213.26
VA split (%)			
Wages	67.00%	67.30%	0.45%
Profit	33.00%	32.70%	-0.91%
Employees ('000s)	8551	10877	27.20
Wages/sales	15.90%	25.50%	60.38
Wages/employee (1)	100.00	249.64	149.64
Profit/sales	7.83%	12.39%	58.21
Value added/sales	23.73%	37.89%	59.66
	Cross period estimates		
Degree of operating leverage			2.18
Cost estimates			**%**
Fixed cost			17.04
Variable Cost			82.96
	1984	**2005**	**Change**
Panel b) Manufacturing			**%**
Sales	100.00	130.43	30.43
Bought in materials and services	69.83	81.59	16.84
Value added (VA)	30.17	48.85	61.90
VA split:			
Wages	21.30	35.609	67.18
Profit	8.87	13.24	49.24
VA split (%)			
Wages	70.60%	72.90%	3.26
Profit	29.40%	27.10%	-7.82
Employees ('000s)	5382	3365	-37.48
Wages/sales	21.30%	27.30%	28.17
Wages/employee (1)	100.00	267.38	167.38
Profit/sales	8.87%	10.15%	14.41
Value added/sales	30.17%	37.45%	24.13
	Cross period estimates		
Degree of operating leverage			1.62
Cost estimates			**%**
Fixed cost		`	14.35
Variable Cost			85.65

Notes:

(1) Index number 1984=100

In addition to reiterating well-known facts, such as the real terms increase in services relative to manufacturing, table 1 also reveals some less well documented trends. In the services sector the split between wages and profits has remained constant throughout the period at 67:33. According to a time series analysis the mean is 66.2% with a standard deviation of only 1.41% and with maximum values of 68.0% and minimum values 63.8% of in 2002 and 1998 respectively. In view of this trend, the conflicting evidence of high and low road flexibility is not surprising, since these tendencies seem to be cancelling each other out in the aggregate. What is more surprising, however, is that the rate of profit in the services sector has increased in the period notwithstanding the constant share of profit in value added. The cause of the increase lies in the higher gross margins that have been achieved. As table 1 shows, the rate of increase in sales has been faster in real terms than the rate of increase in bought in goods and services, which has increased the aggregate operating margin. There are a number of possible reasons for this, including greater market power over suppliers, falls in the relative cost of commodity inputs and reductions in legislated and effective corporate taxation rates.

Whatever the reason, there has been a shift to profits in the sector without a concomitant shift from labour to profits. As a result, the expansion of the service sector has occurred in association with a significant *rise* in labour intensity, as illustrated by the rise in the labour to sales ratio in table 1. Meanwhile, the rate of increase in profit is 2.18 times the rate of increase in sales. This measure, referred to as the degree of operating leverage (DOL), facilitates the computation of an empirical proxy for the relative fixity of cost. Accordingly, with a DOL of 2.18, the implied fixed cost is 17.04% of the total, with the remainder implied to be variable.[6] Many costs have semi-variable characteristics, but some demonstrate greater fixity, even within fairly wide ranges of output. Labour cost would be one example where contracts might be paid at fixed rates instead of for the output delivered, which is truer of services, where output is more difficult to measure, than manufacturing. As can be seen from table 1, the proportion of fixed cost is higher in services than in

manufacturing. In view of the increased labour intensity of services and the relatively high fixed cost, the corollary is greater potential risk for shareholders. Because of the higher proportion of fixed cost, there is likely to be a higher degree of variation in profit for any given change in sales demand, so there are disproportionate returns available to investors if the sector continues to grow.

Services firms' profits are therefore also more vulnerable to a fall in sales revenue than manufacturing firms. At the same time, the rate of post tax profit is higher for service firms compared to manufacturing. The secular trend in service sector profits is consistently higher than manufacturing. In the period 1989-2007, net profit rates averaged 15.88% and 10.24% respectively for services and manufacturing, with all years showing a positive difference between services and manufacturing.[7] In the language of conventional economic analysis, such a premium may irrationally reflect the distortions of superior market power or taxation effects, or as seems to be the case suggested by table 1, as a function of fixed cost, may be a rational risk premium.

Applying similar measures to manufacturing, it is by comparison a lower risk and lower return activity. As in services, there has been an increase in real term sales and a relatively smaller increase in bought in goods and services. The rate of profit has therefore risen through time, although not to the same extent as services. There has also been a rise in labour intensity, as measured by the ratio of labour to sales and a small shift from profits to wages. However, this is more than offset by the relative decline in bought in goods and services, thereby allowing the rate of profit to rise. Meanwhile, although fewer in number, the remuneration of employees increased at a higher rate than for service sector workers. The DOL is lower in manufacturing than services, implying a greater proportion of variable cost. Whilst such a cost structure implies some insulation from risk for investors, for the employee the opposite is the case, since remuneration is more likely to vary with output. In other words, the corollary of the rational risk premium for investors is an obverse but equally rational risk premium for employees. It is more risky to work in manufacturing, but the rewards are higher.

Although the analysis at aggregate level yields some potentially interesting results, it is useful to keep these on hold pending a further examination with a firm-level dataset. To assist further comparison, two sample groups were drawn from the populations of firm level accounting and stock market data for two six-year sample periods, 1979-1984 inclusive and 1998-2003 inclusive. The periods were chosen to reflect two different regimes of accumulation, the first being associated with a shakeout of manufacturing associated with globalization and liberalization of capital markets but which before the miners' strike of 1984-5 still manifested aspects of entrenched trade union power. The second is a strong period of expansion and subsequent contraction of the service sector associated with the 'Dot.com' boom. For each period, firm-level and market index stock price data was obtained from *Datastream.* Accounting data was obtained from the Cambridge University Companies Database CD-ROM and from *Datastream* for the earlier and later periods respectively. To be included in the sample a firm had to have six years continuous accounting results and be member of one of the industry groupings set out in table 2 according to the *Datastream* INDC2 classification. These sub-sectors were chosen in order to provide contrasts between service and non-service activities and between cyclical and non-cyclical activities. Within these broad groups, the sectors were chosen to correspond as closely as possible to ONS *Blue Book* definitions for available time series data. Selection on these lines facilitated comparison of sample results and trends with national benchmark indices. Firms with unconventional accounting ratios (e.g. financial and insurance) likely to impair cross-sectional comparability or obviously diversified activities and straddling analytical groups (e.g. conglomerates) were explicitly excluded. Exclusions due to firms having missing accounting data, missing stock market data or for reasons of industry group membership, produced sample sizes of 108 for the period 1979-1984 and 164 for the period 1998-2003. No attempt was made to achieve continuous panel membership for firms through the two periods, since the rate of attrition due to takeovers and corporate failures is very high over such a long interval.

Industry groupings are formed using *Datastream* codes at INDC2 level. These were developed into a four way split consisting of BASIC, INDUSTRIAL, CYC, NCYC and reformed using a dichotomous variable of service and non-service according to table 2. The services group corresponds as closely as possible to the components of the services group in the ONS *Blue Book* which was relied upon for the analysis of the data in table 1. GENIN corresponds closely to the manufacturing group.

Table 2: Industry Groupings

Group	**N**	**Group***	**N**	**Example activities**
Non Services	201	BASIC	57	Basic Construction Building materials Resources Utilities
		GENIN	51	General industrial
		CYCL	123	Cyclical consumer goods
Services	71			Cyclical services General retail Information Technology
		NCYC	41	Healthcare Non cyclical services Food retail
Total	**272**		**272**	

* *Datastream* classification, INDC2

A comparative statistical analysis, using mean comparisons, is presented in table 3. To complement the analysis in table 1, measures were developed for operating leverage, financial leverage and labour intensity. Degree of operating leverage (*DOL)* is as defined in the discussion of table 1 above and measured specifically*: DOL= %ΔX / %ΔS,* where *%ΔX* and *%ΔS* are the percentage changes in earnings before interest and tax (EBIT) and in sales respectively, both of which are obtained from *Datastream*. *DFL = %ΔY/%ΔX* and *Y* is the earnings after interest and before tax and *X* is EBIT. *LABSAL* is the labour cost to sales turnover ratio calculated as L/S for the years 1984 and 2004 respectively where L is labour cost and S is sales turnover. The industry

groupings in table 2 are used to provide contrasts between mean values through time. Because financial ratios are typically non-normally distributed (Ezzamel, et al. 1987), a non-parametric mean difference test was also conducted.

Table 3: Mean difference tests, by variable and industry sector

By main variable	**Mean Value by Decade**				
	2000s	**1980s**	**Difference**	**t value (1)**	**z value (2)**
Operating leverage (DOL)	7.284	2.438	4.846	3.734***	5.583***
Financial leverage (DFL)	1.583	1.054	0.529	3.916***	4.721***
Labour intensity (LABSAL)	0.220	0.187	0.033	2.416***	2.023**
Sales £m (DEFSAL)	563.763	660.861	-97.098	0.719	0.895
N	164	108			
Operating leverage by industry					
Non Service	6.881	2.130	4.751	3.647***	5.286***
Service	8.350	3.410	4.940	1.454*	2.071**
BASIC	5.837	2.695	3.142	1.501*	1.730*
CYC	7.635	3.299	4.336	1.745**	2.296**
NCYC	11.116	1.131	9.985	2.606***	3.477***
GENIN	3.859	2.123	1.736	1.338*	3.542***
Financial leverage by industry					
Non Service	1.619	1.055	0.565	3.288***	4.152***
Service	1.488	1.053141	0.434	2.461***	2.203***
BASIC	1.729	1.125	0.604	1.0901	1.352
CYC	1.625	1.027	0.598	3.201***	3.552***
NCYC	1.258	1.161	0.097	0.546	0.471
GENIN	1.435	0.995	0.440	3.042***	2.968***
Labour intensity by industry					
Non Service	0.207	0.196	0.010	0.757	0.494
Service	0.255	0.159	0.097	2.848***	3.092***
BASIC	0.201	0.207	-0.006	1.574***	1.046
CYC	0.244	0.183	0.061	2.506***	2.234**
NCYC	0.212	0.136	0.076	3.159***	2.772***
GENIN	0.273	0.213	0.060	2.824***	2.700***

Notes:

(1) *t*-test statistic
(2) Mann Whitney Wilcoxon rank sum test for unmatched data

*** *p*-value <0.01; ** < 0.05; * < 0.1*

As table 3 indicates, there were significant increases in all three variables of interest in the 2000s compared to the 1980s. Real terms sales turnover, a control variable, showed a minor and insignificant difference. The large and statistically significant increase in operating leverage is explained mainly by increases in the non-service, cyclical, and non-cyclical sectors. For the full sample, there is a large and significant increase in operating leverage through time. The rate of increase is much larger for services than for GENIN (manufacturing), confirming the analysis in table 1. The increase in financial leverage is explained by increases in both service and non-service sectors, with a slightly larger increase being from non-service, with larger increases in cyclical and to some extent in the GENIN manufacturing sub-sector. A generic explanation is the increase in the use of debt finance, per se. In the 1980s, 28/108 = 25.9% of firms had no borrowing (DFL = 0), but by the 2000s this proportion had fallen to 3/164= 1.82%. The increase in labour intensity is explained by increases in the service sector in particular, with some significant increase also in manufacturing, but with the increase in non-service intensity being statistically insignificant. Non-cyclical firms were the most important sub-sector contributing to the increase, with other sectors also contributing to the overall increase except the basic group which had a significant decrease.

As suggested above, a possible cause of increased operating leverage is increased labour intensity. The relationship between labour intensity and operating leverage and other variables was explored further using regression analysis. Following figure 1, each has a potential impact on residual stock market risk. Results are reported in table 4. For the purposes of statistical testing DOL, DFL, LABSAL and DEFSAL were log-transformed as LNDOL, LNDFL, LABSAL and LNDEFSAL respectively, to produce closer correspondence to normal distributions. Even with such transformations the residuals of the regression models were non-normal and therefore all tests reported in table 4 are specified using non-parametric quantile regression. The following generic model was used:

$$RISK = a_0 + a_1 LNLABSAL + a_2 LNDEFSAL + a_3 YEAR + a_{4,1} D_1 + a_{5,2} D_2 + \ldots + a_{6,n-1} D_{n-1} + e \qquad (1)$$

Where RISK is measured in turn by LNDOL, LNDFL and BETA, allowing a comparison of which type of risk is the most impacted by the labour intensity of the underlying activity. BETA = the slope co-efficient of the 60 month time series estimation of the ordinary least squares regression of individual stock returns against returns for the market index. For each period, the monthly observations are drawn from the calendar years 1980-1984 and 1999-2003 respectively.[8] Because BETA is computed as a measure relative to an index, it is a stationary measure and therefore shows the risk relative to the cross sectional sample.

Table 4: Determinants of operating, financial and stock market risk

Model (1)	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**
Dependent variable	**LNDOL**	**LNDFL**	**BETA**	**INDOL**	**BETA**
LNLABSAL	0.326	0.004	0.089	0.314	0.161
	(2.06)**	(0.72)	(2.41)**	(1.84)*	(2.74)***
LNDEFSAL	-0.019	0.003	0.099	-0.024	0.073
	(0.42)	(1.31)	(6.58)***	(0.32)	(2.94)***
CYC	-0.108	0.008	0.003	-0.307	0.014
	(0.67)	(0.98)	(0.05)	(1.27)	(0.17)
NCYC	-0.151	0.001	-0.339	0.015	-0.449
	(0.74)	(0.07)	(4.77)***	(0.05)	(4.1)***
GENIN	-0.167	0.005	0.061	-0.241	0.019
	(0.81)	(0.47)	(0.86)	(0.65)	(0.15)
YEAR	0.665	0.189	-0.055		
	(5.06)***	(27.9)***	(1.23)		
Constant	0.905	-0.028	-0.051	1.869	0.358
	(1.57)	(0.93)	(0.26)	(1.93)	(1.08)
Pseudo R^2	0.068	0.064	0.125	0.014	0.124
N (2)	272	272	272	164	164

Notes:
(1) Shapiro-Wilk test rejected the hypothesis of normally distributed residuals; model re-specified using non-parametric quantile regression.
(2) Models 1.1-1.3 full sample; models 1.4-1.5 restricted to 1998-2004 sub-sample only

*** *p*-value <0.01; ** < 0.05; * < 0.1*

The results of the regressions for model (1) show that labour intensity is a significant determinant of operating leverage, regardless of the period of observation (Models 1.1 and 1.4). Taken together, the results in table 3 and models 1.1 and 1.4 therefore suggest that service industry firms specifically have become more labour intensive, and have done so whilst taking on operating and financial risk in similar proportions to the rest of the economy. Basic industries became more capital intensive and basic firms were subject to relatively smaller increases in operating and financial risk. As these sub-group illustrations suggest, because more labour intensive firms are associated with higher risk in their operating cost structure, labour cost risk would seem to be an important component of operating cost risk. Especially in services, it would seem firms are becoming more labour intensive, exhibiting greater fixity in their cost structure and becoming

thereby less 'flexible', increasing the potential risk faced by investors. Such an effect is compounded by these firms taking on extra financial leverage in the line with the general increase in financial leverage recorded for firms across the whole sample.

Further tests revealed that the positive relationship between labour intensity and operating risk persisted for the 1998-2004 sub-sample but not for the earlier period. There was also a positive relationship between labour intensity and stock market risk in the 1998-2003 sub-sample but not for the earlier period. There was no relationship between labour intensity and financial risk in any of the sub-periods or for the combined sample.

The increase in financial leverage noted in table 3 does not appear to be specifically associated with a rise in labour intensity or any particular sector (model 1.2), reinforcing the conclusion that the increase in leverage has been across the board. Stock market risk, measured by BETA, is pushed up significantly by labour intensity (models 1.3 and 1.5), but is also reduced by non-cyclical, larger firms, which is to be expected.

Firms are more labour intensive and more risky from the perspective of the stock market investor notwithstanding the reduced employee protection implied by the low road flexibility. Conversely, the evidence suggests either an increase in market based implicit bargaining power for skilled workers, in line with high road flexibility hypothesis, or a simultaneous increase in risk for both employers and employees. Concurrently and whatever the cause of the increase in operating risk, there has been a step increase in financial leverage and therefore financial risk, which has occurred at the behest of market institutions and corporate managements, without apparent reference to the underlying operating risk. Stock market investors face the consequences of increases in both these classes of risk. In conclusion, the aggregate risk faced by UK investors has increased substantially in the 2000s compared to the 1980s notwithstanding the major institutional changes that have occurred in the intervening period.

To examine the possibility of indirect and direct relationships between labour intensity, operating leverage, and stock market risk, further tests were carried out. As suggested in figure 1,

whereas operating risk and financial risk are important in themselves as reflections of the underlying cost structure of the firm and the behaviour of those costs, they are also important for their potential transmission of risk into the financial markets. The next series of tests examine these relationships. The following generic model was tested:

$$BETA = a_0 + a_1 LNDOL + a_2 LNDFL + a_3 LNLABSAL + a_4 LNDEFSAL + a_5 YEAR + a_{6,1} D_1 + a_{6,2} D_2 + \ldots + a_{6,n-1} D_{n-1} + e \quad (2)$$

In view of the relationship between LNDOL and LNLABSAL in table 4, these variables are tested independently as determinants of beta. As in the case of model (1) even with variable log transformations, the residuals of the regression models were non-normal and, therefore, all tests reported in table 5 are specified using non-parametric quantile regression.

Table 5: Determinants of stock market risk

Model (2)	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
Dependent variable	**BETA**	**BETA**	**BETA**	**BETA**	**BETA**	**BETA**
LNDOL	0.033		0.039	-0.008		
	(1.50)*		(1.52)*	(0.26)		
LNDFL	0.007	0.026	-0.035	0.132	-0.082	0.135
	(0.12)	(0.62)	(0.56)	(2.74)***	(1.62)	(2.90)***
LNLABSAL		0.087			0.151	0.031
		(2.38)***			(2.88)***	(0.59)
LNDEFSAL	0.085	0.098	0.096	0.066	0.066	0.076
	(4.24)***	(6.56)***	(3.45)***	(3.16)***	(2.97)***	(3.51)***
CYC	0.020	-0.002	0.059	-0.066	0.028	-0.071
	(0.28)	(0.04)	(0.66)	(0.68)	(0.38)	(0.75)
NCYC	-0.323	-0.334	-0.326	-0.320	-0.435	-0.321
	(3.47)***	(4.73)***	(2.66)***	(2.89)***	(4.44)***	(2.99)***
GENIN	0.094	0.056	0.188	0.116	0.024	0.104
	(1.04)	(0.81)	(1.39)	(1.21)	(0.21)	(1.08)
YEAR	-0.086	-0.052				
	(1.37)	(1.15)				
cons	-0.046	-0.036	-0.290	0.202	0.429	0.149
	(0.18)	(0.18)	(0.81)	(0.76)	(1.45)	(0.57)
Rsq	0.122	0.126	0.102	0.205	0.130	0.209
N (2)	272	272	164	108	164	108

Notes:
(1) Shapiro-Wilk tested rejected the hypothesis of normally distributed residuals; model respecified using quantile regression.
(2) Models 1.1-1.2 full sample; models 1.3 & 1.5 restricted to 1998-2004 sub-sample only models 1.4 and 1.6 restricted to 1979-1984 sub-sample only.

*** *p*-value <0.01; ** < 0.05; * < 0.1*

In general, there is a weakly significant positive relationship between operating leverage and stock market risk (models 2.1 and 2.3). The relationship is not present al all for tests restricted to the 1979-1984 sub-sample. Labour intensity is strongly and consistently positively significant for all time periods. An interaction variable (LNDOL*LNLABSAL) was used in conjunction with LNDOL and LNLABSAL in turn, but was consistently insignificant regardless of time period. In other words, in view of their separate significance, labour intensity and operating leverage are substitutive rather than complementary determinants of stock market risk.

Financial leverage is not a consistently strong determinant of stock market risk (models 2.1 and 2.2). Only in the early sub-period (models 2.4 and 2.6) is there a significant and positive relationship. In the later period, the relationship is not significant (models 2.3 and 2.5). Despite the increase in financial leverage between the two sub-periods, the evidence suggests that these expanded levels of debt were no longer recognised or priced effectively by the stock market of the early 2000s. An interaction variable (LNDFL*LNDOL) was used in conjunction with LNDOL and LNDFL in turn, but was consistently insignificant regardless of time period. When LNDFL was dropped from model 2.1 the significance of LNDOL increased ($p < 0.05$) and the already highly significant co-efficient for LNDFL in model 2.4 improved further in the absence of LNDOL. Therefore, financial leverage and operating leverage are substitutive rather than complementary determinants of stock market risk. Part of the explanation however, depends on the type of finance giving rise to the interest costs in the financial leverage measure. For example, firms using overdraft financing only, had significantly higher operating leverage. In other words, firms with commitments to fixed operating costs tend to rely on overdrafts rather than structured finance and vice versa for firms with low operating leverage.

There are few sector effects except for the tendency of non-cyclical firms to have lower stock market risk already noted in the discussion above. The use of sector grouping variables improved the overall performance of all models in terms of *R*-squared when compared with alternative models replacing them with a service dummy variable, so these are the models reported in tables 4 and 5. However, it should be noted that the significance of the labour intensity and operating leverage variables increased, reflecting the higher levels of labour intensity and operating leverage in the service industries.

Drawing generalisations, the consequences of increasing underlying risk are to increase the cross-sectional positioning of the firm's perceived stock market risk. Labour intensity, operating leverage and financial leverage in descending order of influence have an effect all the time in the first two cases and some of the time in the case of financial leverage. The presence of one without

the others is generally sufficient to raise the level of stock market risk to some extent. The effects are not sector specific.

These findings, in particular the relative unimportance of financial leverage in the 1998-2003 period, are surprising in view of the apparent risk of the shareholder value driven financial restructurings and wide availability of cheap debt finance. A possible reason, which is also a positive explanation of the other results, is that cash flows associated with debt finance are immaterial relative to those associated with the other costs of the firm including labour cost. Labour cost, particularly that higher portion that is fixed has a more important impact on stock market risk and potentially on investment, by raising the cost of capital for firms with those cost patterns. The substitutive effects of labour intensity and operating leverage may be explained by the substitution of increased fixed cost/reduced variable cost in labour with concurrent increased variable cost/reduced fixed cost in the non-labour components of operating leverage. For example, greater flexibility in supplier contracts and sub-contracting may give firms the opportunity to make fixed investments in the core workforce.

CONCLUSION: REGIMES OF ACCUMULATION, REGULATION AND RISK

Some of the contrasts between the early 1980s and the early 2000s are as expected. The shift to services has been accompanied by greater labour intensity and the level of corporate borrowing has increased considerably for all sectors.

Whatever the effects of these shifts on the content and remuneration of labour, it would seem that in terms of social risk sharing, the balance has swung in favour of labour and against capital. The high road story of post-Fordism and the knowledge economy carries more weight than the low road low skilled flexible workforce of neo-Fordism. This conclusion is all the more surprising in view of the exclusion of financial services from our analysis in favour of service sectors such as transport, support, and retailing that typically might be more suggestive of the low road model. Of course, this does not mean that workers in 2005 are more secure than workers in

1985 per se. Changes in the structure of the economy that have been only partially discussed in this paper may imply increased risk for all groups in society. What can be said is that whatever the new level of risk arising from demand fluctuations, labour bears a smaller part. The implication is that financial risk as borne by investors has increased regardless of how it is measured. When the increased implied by changes in operating cost structures is added to the much higher levels of financial leverage present in the typical firm's balance sheet in 2003, it is clear that investors were sitting on a powder keg of risk.

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NOTES

1. Defined as "… the increasing role of financial motives, financial markets, financial actors and financial institutions in the operations of the domestic and international economies." Epstein (2005, p. 3).

2. The evident lack of an empirical relationship between stock market returns and the relationship implied by the CAPM has led some to doubt its validity (Davis et al, 2000, Fama and French, 1992, 1996). However these debates have concerned themselves exclusively with capital market data and have made scant reference to the underlying cost structure of the firms involved.

3. After 1973 in all the advanced countries the expansion of service output accounts for roughly two-thirds to four-fifths of the increase of GDP: Germany, the UK and the USA are all in the range 75 to 80 per cent and Japan is not far behind at 62 per cent (Froud et al, 1997: 356).

4. These developments characterise the UK and also reflect similar trends in other industrialized economies (e.g. Auer and Cazes, 2003; Felstead and Jewson, 1999).

5. OECD, http://stats.oecd.org/wbos/, productivity and labour indices. ONS, *Blue Book*, http://www.statistics.gov.uk/StatBase/, Indices of Production, Services and Distribution, value added by industry, accounts by sector.

6. The formula is: Variable Cost % = Sales – (DOL x net profit), ie 100 – (7.83 x 2.18).

7. ONS *Blue Book*, Time Series data, 1989 is the earliest date available for the Services sector.

8. Five inclusive calendar years are used for beta computations, whereas six years of accounting data is required in order to compute DOL and other ratios on the basis of five equivalent compounding periods.

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